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publish at full length and with suitable explanations the entire calculation for one eclipse. If he will do this, I should be glad if he will select the eclipse of − 1123. This is a very important one, for his figures on *M.N.*, lxvi. p. 414, indicate that the theoretical accelerations (Mr Nevill's B) make this eclipse total near Babylon. My figures on *M.N.*, lxvi. p. 532, contradict this conclusion.

As the foregoing remarks have brought me to the eclipse of Babylon, I may add—

1. Mr King originally indicated the second half of the eleventh century B.C. as the probable date. He has recently discussed this eclipse very fully in the first volume of *Chronicles concerning Early Babylonian Kings* (Luzac & Co., 1907).

2. According to my calculations, at no date in the summer months of either the eleventh or twelfth centuries B.C. except − 1062 July 31 could the Babylonians have seen any phenomenon answering to the words of the inscription quoted on *M.N.*, lxv. p. 861.

3. Mr King, though he dislikes the equation, Sivan 26 = July 31, does not reject it. I see no alternative to accepting it.

The Perturbations of Halley's Comet. By P. H. Cowell and A. C. D. Crommelin.

The action of Saturn is here considered. The calculations are similar in character to those for the action of Jupiter published on pp. 386–411.

The differential equations given on p. 386 are again applicable. In the value of e_x on that page the square root should be omitted, so that we have

$$e_x = -(1 - e^2) \sin u \cos u.$$

Table I., pp. 387–390, is again applicable. The tabulated values of e_x are correct.

The $V = V_3 + V_4$ method explained on p. 391 is again introduced at $u = 90°$ and dropped at $u = 270°$. V_4 would be the disturbing function if the motion were referred to the centre of gravity of the Sun and disturbing planet. Hence $V_3 = V - V_4$ is the change in the disturbing function that would arise from a displacement of the origin of co-ordinates. This consideration gave us the assurance, *a priori*, that the differential equations depending on V_3 would be integrable.

The positions of Saturn have been taken from a table with argument g' mean anomaly of Saturn similar to Table II., pp. 394–401. The table is not printed here, but it is based upon the following assumptions and formulæ.

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For Saturn $e' = \cdot 05607$, hence

$$\frac{\xi'}{a'} = -\frac{3}{2}e' + \left(1 - \frac{3}{8}e'^2\right)\cos g' + \left(\frac{1}{2}e' - \frac{1}{3}e'^3\right)\cos 2g' + \frac{3}{8}e'^2 \cos 3g' + \frac{1}{3}e'^3 \cos 4g'$$

$$= \cos g' - \cdot 084\ 105 - \cdot 001\ 179 \cos g' + \cdot 027\ 976 \cos 2g' + \cdot 001\ 179 \cos 3g' \\ + \cdot 000\ 059 \cos 4g'$$

$$\frac{\eta'}{a'} = \left(1 - \frac{5}{8}e'^2\right)\sin g' + \left(\frac{1}{2}e' - \frac{5}{12}e'^3\right)\sin 2g' + \frac{3}{8}e'^2 \sin 3g' + \frac{1}{3}e'^3 \sin 4g'$$

$$= \sin g' - \cdot 001\ 965 \sin g' + \cdot 027\ 962 \sin 2g' + \cdot 001\ 179 \sin 3g' \\ + \cdot 000\ 059 \sin 4g'$$

Also

$$g' = 112^\circ \cdot 09 + 144^\circ \cdot 8437\ nt$$

$$\frac{a'}{a} = \cdot 539\ 842$$

Also let NCϖ be the comet's orbit, ♈CS the ecliptic of 1850, Nϖ'S the orbit of Saturn,

$$♈\text{C} = 55^\circ\ 50' \qquad \text{C}\varpi = 111^\circ\ 0' \qquad \text{NCS} = 17^\circ\ 46'$$

$$♈\text{S} = 112^\circ\ 21' \qquad \text{S}\varpi' = -22^\circ\ 14' \qquad \text{CSN} = 2^\circ\ 30'$$

Hence $\text{NC} = 6^\circ\ 20' \qquad \text{N}\varpi = 117^\circ\ 20'$

$\text{NS} = 50^\circ\ 31' \qquad \text{N}\varpi' = 28^\circ\ 17'$

$\text{CNS} = 180^\circ - 19^\circ\ 15'$,

and hence

$$\frac{x'}{a} = -\cdot 432\ 815\frac{\xi'}{a'} - \cdot 281\ 251\frac{\eta'}{a'}$$

$$\frac{y'}{a} = -\cdot 311\ 431\frac{\xi'}{a'} + \cdot 433\ 315\frac{\eta'}{a'}$$

$$\frac{z'}{a} = +\cdot 084\ 333\frac{\xi'}{a'} + \cdot 156\ 733\frac{\eta'}{a'}$$

We have performed the mechanical quadratures with intervals $du = 2^\circ$. With this value of du

$$\left(\frac{a}{r'}\right)^3 du = \cdot 222\ 920 + \cdot 037\ 453 \cos g' + \cdot 003\ 139 \cos 2g' + \cdot 000\ 259 \cos 3g'$$

Table III. (the enumeration being the same as on pp. 402–404) gives the disturbing forces.

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TABLE III.

First Quadrant. Unit 0·0001.					*Second Quadrant.* Unit 0·0001.				
u	*g′*	a^2X*du*	a^2Y*du*	a^2Z*du*	*u*	*g′*	a^2X_4du	a^2Y_4du	a^2Z_4du
1°	112°·17	− 68	− 6	+ 1	91°	202°·07	+ 104	− 94	+ 33
3	112·34	74	+ 31	11	93	207·29	105	77	31
5	112·52	76	70	22	95	212·69	104	62	30
7	112·71	76	111	34	97	218·26	100	47	29
9	112·93	71	157	47	99	223·99	95	34	27
11	113·17	62	205	61	101	229·90	88	23	25
13	113·44	48	255	75	103	235·97	80	12	23
15	113·75	− 28	308	90	105	242·21	72	− 3	21
17	114·11	+ 2	360	106	107	248·61	61	+ 5	19
19	114·51	38	414	120	109	255·18	52	11	17
21	114·97	86	466	135	111	261·91	41	16	15
23	115·50	142	512	149	113	268·80	30	21	13
25	116·08	209	548	160	115	275·84	19	22	10
27	116·75	286	574	168	117	283·04	10	23	8
29	117·48	369	579	172	119	290·39	+ 1	21	6
31	118·30	457	566	171	121	297·89	− 7	20	4
33	119·21	545	531	165	123	305·54	13	16	2
35	120·22	625	470	153	125	313·33	18	11	+ 1
37	121·32	694	384	136	127	321·26	21	+ 6	0
39	122·52	743	279	114	129	329·33	21	− 1	0
41	123·83	770	156	91	131	337·53	18	9	0
43	125·25	772	+ 25	67	133	345·86	12	15	+ 1
45	126·79	751	− 107	43	135	354·31	− 3	20	3
47	128·45	709	236	22	137	2·88	+ 8	23	6
49	130·23	648	356	+ 4	139	11·57	19	22	10
51	132·15	572	461	− 10	141	20·37	28	17	12
53	134·19	488	553	19	143	29·28	32	10	14
55	136·37	398	629	24	145	38·30	34	− 1	15
57	138·69	305	691	26	147	47·41	28	+ 7	14
59	141·16	210	739	22	149	56·61	19	12	12
61	143·77	118	775	17	151	65·90	10	14	9
63	146·53	+ 28	797	− 8	153	75·27	+ 1	13	7
65	149·44	− 59	810	+ 4	155	84·72	− 6	10	4
67	152·51	143	813	17	157	94·25	10	8	2
69	155·73	223	807	32	159	103·84	12	+ 3	+ 1
71	159·12	300	793	48	161	113·49	13	− 1	0
73	162·66	374	774	66	163	123·20	10	3	− 1
75	166·37	444	746	85	165	132·95	8	7	− 1
77	170·24	511	712	104	167	142·75	4	8	0
79	174·28	572	671	125	169	152·59	− 1	9	0
81	178·49	630	624	145	171	162·46	+ 4	9	+ 1
83	182·86	686	572	167	173	172·36	6	8	1
85	187·41	736	514	188	175	182·28	8	8	2
87	192·12	781	449	210	177	192·19	12	5	3
89	197·01	− 824	− 379	+ 231	179	202·16	+ 14	− 4	+ 3

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TABLE III.—*continued.*

Third Quadrant. Unit 0·0001.					*Fourth Quadrant.* Unit 0·0001.				
u	g'	a^2X_4du	a^2Y_4du	a^2Z_4du	u	g'	a^2Xdu	a^2Ydu	a^2Zdu
269°	212°·19	+ 152	+ 57	+ 38	359°	302°·09	− 77	− 39	− 9
267	206·97	143	40	32	357	301·92	70	78	23
265	201·57	132	26	27	355	301·74	59	126	37
263	196·00	119	13	22	353	301·55	42	171	52
261	190·27	106	+ 1	18	351	301·33	− 20	216	68
259	184·36	93	− 8	14	349	301·09	+ 8	261	84
257	178·29	80	15	11	347	300·82	43	303	101
255	172·05	65	21	8	345	300·51	86	344	118
253	165·65	52	26	5	343	300·15	136	377	134
251	159·08	40	28	3	341	299·75	194	404	150
249	152·35	27	30	+ 1	339	299·29	259	418	163
247	145·46	14	29	− 1	337	298·76	329	420	175
245	138·42	+ 4	29	2	335	298·18	400	404	182
243	131·22	− 5	27	2	333	297·51	471	369	185
241	123·87	13	22	3	331	296·78	537	316	182
239	116·37	19	18	3	329	295·96	593	243	173
237	108·72	23	12	2	327	295·05	634	152	156
235	100·93	26	− 5	− 1	325	294·04	658	− 47	134
233	93·00	25	+ 1	+ 1	323	292·94	659	+ 68	105
231	84·93	22	9	4	321	291·74	640	185	72
229	76·73	15	15	6	319	290·43	601	299	− 36
227	68·40	− 6	20	10	317	289·01	544	406	+ 1
225	59·95	+ 5	23	13	315	287·47	473	501	39
223	51·38	17	21	15	313	285·81	390	584	76
221	42·69	28	18	16	311	285·03	302	652	110
219	33·89	35	+ 11	16	309	282·11	208	706	143
217	24·98	36	0	14	307	280·07	113	744	174
215	15·96	33	− 8	11	305	277·89	+ 18	770	201
213	6·85	24	13	8	303	275·57	− 72	783	226
211	357·65	14	16	4	301	273·10	161	785	248
209	348·36	+ 4	15	+ 2	299	270·49	247	777	267
207	338·99	− 3	13	0	297	267·73	327	760	285
205	329·54	8	8	0	295	264·82	402	734	298
203	320·01	11	− 3	0	293	261·75	474	700	311
201	310·42	10	+ 1	0	291	258·53	541	660	321
199	300·77	9	3	+ 1	289	255·14	602	613	330
197	291·06	6	6	2	287	251·60	657	560	334
195	281·31	− 2	7	2	285	247·89	709	503	339
193	271·51	0	7	3	283	244·02	755	440	340
191	261·67	+ 5	7	4	281	239·98	795	374	339
189	251·80	9	6	4	279	235·77	828	302	336
187	241·90	12	5	4	277	231·39	856	228	331
185	231·98	13	+ 3	4	275	226·85	877	149	323
183	222·07	14	0	4	273	222·14	892	+ 69	314
181	212·10	+ 14	− 2	+ 4	271	217·25	− 900	− 14	+ 303

Table IV. gives for argument u

$$\frac{1}{m'}\frac{dn}{n},\ \frac{1}{m'}\,de,\ \frac{1}{m'}\,ed\varpi,\ \frac{d\epsilon}{m'}-\frac{d\varpi}{m'}\left\{1-\sqrt{(1-e^2)}\right\}\text{ and }\frac{1}{m'}\frac{dn}{n}(2\pi-nt)$$

The mechanical quadratures for the second and third quadrants require to be supplemented by the definite integrals arising from V_3.

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TABLE IV.

First Quadrant.

u	$\frac{1}{m'}\frac{dn}{n}$	$\frac{1}{m'}de$	$\frac{1}{m'}ed\varpi$	$\frac{de}{m'}-\frac{d\varpi}{m'}\{1-\sqrt{(1-e^2)}\}$	$\frac{1}{m'}\frac{dn}{n}\times(2\pi-nt)$
1°	+ ·0001	·0000	+ ·0001	·0000	+ ·001
3	− ·0036	+ ·0001	·0001	·0000	− ·023
5	·0073	·0001	·0001	·0000	·046
7	·0112	·0003	·0001	·0000	·070
9	·0151	·0004	·0001	− ·0001	·095
11	·0188	·0004	·0002	·0001	·118
13	·0221	·0005	·0002	·0002	·139
15	·0249	·0005	+ ·0001	·0003	·156
17	·0260	·0006	− ·0001	·0004	·163
19	·0261	·0006	·0005	·0006	·164
21	·0239	·0006	·0011	·0007	·150
23	·0193	·0006	·0019	·0010	·121
25	− ·0114	·0004	·0030	·0012	− ·071
27	·0000	·0003	·0045	·0012	·000
29	+ ·0151	+ ·0001	·0063	·0011	+ ·094
31	·0336	− ·0002	·0083	·0008	·210
33	·0552	·0005	·0104	− ·0001	·344
35	·0783	·0009	·0125	+ ·0010	·488
37	·1019	·0013	·0143	·0026	·634
39	·1238	·0017	·0155	·0048	·769
41	·1425	·0021	·0159	·0075	·884
43	·1566	·0024	·0152	·0104	·969
45	·1651	·0028	·0135	·0135	1·022
47	·1679	·0032	·0108	·0168	1·036
49	·1645	·0036	·0070	·0197	1·013
51	·1555	·0039	− ·0024	·0222	·955
53	·1423	·0043	+ ·0030	·0243	·872
55	·1253	·0047	·0090	·0256	·767
57	·1054	·0052	·0154	·0262	·643
59	·0830	·0056	·0221	·0257	·505
61	·0596	·0061	·0288	·0243	·361
63	·0351	·0067	·0355	·0218	·212
65	+ ·0101	·0074	·0421	·0182	+ ·061
67	− ·0153	·0079	·0485	·0134	− ·092
69	·0404	·0085	·0542	+ ·0072	·242
71	·0654	·0090	·0601	− ·0003	·390
73	·0900	·0095	·0654	·0093	·534
75	·1140	·0100	·0700	·0197	·674
77	·1372	·0104	·0740	·0318	·807
79	·1588	·0106	·0769	·0451	·929
81	·1793	·0108	·0792	·0601	1·044
83	·1990	·0108	·0805	·0768	1·153
85	·2166	·0105	·0808	·0948	1·249
87	·2322	·0101	·0796	·1141	1·331
89	− ·2467	− ·0092	+ ·0775	− ·1349	− 1·405
Sums,	+ ·0163	− ·1744	+ ·8604	− ·3095	+ ·674

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Table IV.—*continued.*

Second Quadrant.

u	$\frac{1}{m'}\frac{dn}{n}$	$\frac{1}{m'}de$	$\frac{1}{m'}ed\varpi$	$\frac{de}{m'}-\frac{d\varpi}{m'}\{1-\sqrt{(1-e^2)}\}$	$\frac{1}{m'}\frac{dn}{n}\times(2\pi-nt)$
91°	+ ·0311	− ·0025	+ ·0040	+ ·0257	+ ·176
93	·0312	·0022	·0023	·0265	·176
95	·0307	·0018	+ ·0010	·0272	·172
97	·0294	·0014	− ·0002	·0269	·163
99	·0277	·0010	·0014	·0266	·153
101	·0256	·0007	·0022	·0256	·140
103	·0232	− ·0004	·0030	·0239	·126
105	·0208	·0000	·0036	·0223	·112
107	·0176	+ ·0003	·0040	·0194	·094
109	·0151	·0006	·0042	·0170	·080
111	·0119	·0008	·0043	·0136	·062
113	·0089	·0011	·0043	·0098	·046
115	·0059	·0011	·0039	·0060	·030
117	·0035	·0012	·0035	+ ·0026	·018
119	+ ·0011	·0012	·0028	− ·0010	+ ·006
121	− ·0010	·0011	·0021	·0044	− ·005
123	·0026	·0010	·0013	·0070	·013
125	·0039	·0006	− ·0004	·0093	·019
127	·0047	+ ·0003	+ ·0004	·0108	·023
129	·0049	− ·0002	·0013	·0107	·023
131	·0045	·0007	·0021	·0090	·021
133	·0034	·0011	·0025	·0057	·016
135	− ·0017	·0015	·0026	− ·0005	− ·008
137	+ ·0003	·0017	·0023	+ ·0060	+ ·001
139	·0024	·0016	·0015	·0126	·011
141	·0043	·0012	+ ·0004	·0181	·019
143	·0052	− ·0007	− ·0006	·0205	·023
145	·0057	·0000	·0017	·0219	·025
147	·0050	+ ·0007	·0022	·0179	·021
149	·0037	·0011	·0021	·0121	·015
151	·0024	·0011	·0018	·0061	·010
153	+ ·0010	·0012	·0012	+ ·0001	+ ·004
155	− ·0001	·0009	·0005	− ·0046	·000
157	·0006	·0007	− ·0001	·0074	− ·002
159	·0011	+ ·0003	+ ·0004	·0088	·004
161	·0014	− ·0001	·0008	·0095	·005
163	·0011	·0003	·0007	·0073	·004
165	·0011	·0007	·0008	·0058	·004
167	·0009	·0008	·0005	·0028	·003
169	·0008	·0009	·0004	− ·0006	·003
171	·0005	·0009	+ ·0001	+ ·0032	·002
173	·0004	·0008	− ·0001	·0047	·001
175	·0004	·0008	·0003	·0063	·001
177	·0002	·0005	·0005	·0093	·001
179	− ·0002	− ·0004	− ·0007	+ ·0108	− ·001
Sums,	+ ·2782	− ·0096	− ·0289	+ ·3175	+ 1·524

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TABLE IV.—*continued.*

Third Quadrant. V_4 only.

u	$\frac{1}{m'}\frac{dn}{n}$	$\frac{1}{m'}de$	$\frac{1}{m'}ed\varpi$	$\frac{d\epsilon}{m'}-\frac{d\varpi}{m'}\{1-\sqrt{(1-e^2)}\}$	$\frac{1}{m'}\frac{dn}{n}$ $\times(2\pi-nt)$
269°	− ·0455	+ ·0015	− ·0022	+ ·0333	− ·028
267	·0426	·0011	·0033	·0327	·028
265	·0392	·0007	·0043	·0316	·027
263	·0353	+ ·0003	·0050	·0297	·026
261	·0314	− ·0001	·0056	·0275	·024
259	·0275	·0004	·0060	·0250	·022
257	·0237	·0007	·0061	·0223	·020
255	·0192	·0009	·0061	·0186	·018
253	·0155	·0012	·0060	·0152	·015
251	·0120	·0013	·0056	·0118	·012
249	·0084	·0015	·0052	·0077	·009
247	·0048	·0014	·0044	+ ·0033	·005
245	− ·0020	·0015	·0038	− ·0003	− ·002
243	+ ·0004	·0014	·0032	·0038	·000
241	·0026	·0012	·0021	·0069	+ ·003
239	·0042	·0009	·0012	·0096	·005
237	·0053	·0006	− ·0002	·0114	·007
235	·0062	− ·0002	+ ·0009	·0128	·009
233	·0060	+ ·0002	·0015	·0123	·009
231	·0055	·0007	·0023	·0111	·008
229	·0041	·0010	·0026	·0071	·006
227	·0023	·0014	·0027	− ·0021	+ ·004
225	+ ·0001	·0016	·0024	+ ·0042	·000
223	− ·0023	·0015	·0015	·0111	− ·004
221	·0045	·0013	+ ·0005	·0177	·006
219	·0059	+ ·0008	− ·0007	·0220	·011
217	·0065	− ·0001	·0019	·0225	·012
215	·0062	·0008	·0026	·0207	·012
213	·0047	·0012	·0026	·0150	·010
211	·0032	·0014	·0022	·0085	·007
209	·0016	·0013	·0015	+ ·0020	·003
207	− ·0005	·0012	·0009	− ·0027	− ·001
205	+ ·0004	·0007	− ·0002	·0059	+ ·001
203	·0011	− ·0003	+ ·0004	·0080	·003
201	·0012	+ ·0001	·0006	·0072	·003
199	·0011	·0003	·0007	·0065	·003
197	·0009	·0006	·0006	·0042	·002
195	·0007	·0007	·0005	− ·0013	·002
193	·0005	·0007	+ ·0003	+ ·0002	·001
191	·0002	·0007	− ·0001	·0039	+ ·001
189	+ ·0001	·0006	·0003	·0070	·000
187	·0000	·0005	·0005	·0093	·000
185	− ·0001	+ ·0003	·0006	·0100	·000
183	·0002	·0000	·0007	·0108	− ·001
181	− ·0003	− ·0002	− ·0007	+ ·0108	− ·001
Sums,	− ·3002	− ·0039	− ·0683	+ ·3212	− ·237

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TABLE IV.—*continued.*

Fourth Quadrant.

u	$\frac{1}{m'}\frac{dn}{n}$	$\frac{1}{m'}de$	$\frac{1}{m'}ed\varpi$	$\frac{de}{m'}-\frac{d\varpi}{m'}\{1-\sqrt{(1-e^2)}\}$	$\frac{1}{m'}\frac{dn}{n}\times(2\pi-nt)$
°					
359	+ ·0034	− ·0001	+ ·0001	·0000	·000
357	·0070	·0001	·0001	·0000	·000
355	·0111	·0002	·0001	·0000	·000
353	·0144	·0003	·0002	·0000	·000
351	·0172	·0004	·0001	− ·0001	·000
349	·0190	·0004	+ ·0001	·0001	·000
347	·0196	·0004	− ·0001	·0002	·000
345	·0186	·0005	·0003	·0003	·000
343	·0156	·0004	·0007	·0004	·000
341	·0102	·0003	·0012	·0005	·000
339	+ ·0019	− ·0001	·0020	·0005	·000
337	− ·0091	+ ·0001	·0030	·0006	·000
335	·0228	·0003	·0041	·0005	− ·001
333	·0391	·0005	·0054	− ·0002	·001
331	·0570	·0008	·0067	+ ·0003	·002
329	·0767	·0012	·0080	·0011	·003
327	·0939	·0016	·0089	·0023	·005
325	·1103	·0019	·0094	·0037	·006
323	·1230	·0022	·0092	·0055	·008
321	·1318	·0025	·0083	·0075	·009
319	·1355	·0027	·0065	·0096	·011
317	·1339	·0029	·0040	·0116	·012
315	·1273	·0032	− ·0006	·0135	·013
313	·1159	·0034	+ ·0035	·0150	·013
311	·1010	·0037	·0081	·0160	·013
309	·0824	·0039	·0132	·0164	·011
307	·0612	·0041	·0187	·0160	·009
305	·0380	·0043	·0243	·0149	·006
303	− ·0144	·0046	·0299	·0128	− ·003
301	+ ·0106	·0048	·0355	·0099	+ ·002
299	·0361	·0052	·0409	·0056	·008
297	·0611	·0054	·0461	+ ·0005	·015
295	·0857	·0057	0506	− ·0059	·022
293	·1101	·0060	·0548	·0136	·031
291	·1335	·0061	·0584	·0226	·040
289	·1556	·0062	·0613	·0327	·051
287	·1760	·0062	·0633	·0441	·062
285	·1956	·0061	·0647	·0567	·073
283	·2132	·0058	·0650	·0707	·086
281	·2287	·0053	·0644	·0855	·098
279	·2417	·0047	·0626	·1010	·111
277	·2528	·0038	·0597	·1175	·123
275	·2611	·0027	·0556	·1345	·136
273	·2669	+ ·0013	·0504	·1517	·147
271	+ ·2700	− ·0004	+ ·0440	− ·1688	+ ·158
Sums,	+ 1·3634	+ ·1156	+ ·8973	− ·8465	+ 1·037

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In order to calculate the definite integrals arising from V_3 for $u = 90°$, $180°$, and $270°$ (the middle value is given in addition to what is strictly necessary, in order to give the results for the second and third quadrants separately), the quantities given in the first half of p. 409 are applicable.

We have in addition—

	$u=90°$	$u=180°$	$u=270°$
g'	199°·52	207°·13	214°·74
$\frac{x'}{a}$	+ ·524	+ ·536	+ ·540
$\frac{y'}{a}$	+ ·175	− ·110	+ ·043
$\frac{1}{na}\frac{dx'}{dt}$	+ ·310	+ ·149	+ ·001
$\frac{1}{na}\frac{dy'}{dt}$	− 1·222	− 1·263	− 1·285
$\frac{1}{m'}\cdot\frac{1}{n}\int dn$	− 0·68	− 1·598	− 1·40
$\frac{1}{m'}\int de$	− 0·387	− 0·665	− 0·351
$\frac{1}{m'}\,e\int d\varpi$	+ 1·16	− 0·094	− 1·36
$\frac{1}{m'}\left[\int d\zeta + \sqrt{(1-e^2)}\int d\varpi - \frac{2\pi - nt}{n}\int dn\right]$	+ 3·32	+ 0·600	− 2·76

Hence

Quadrant.		$\frac{1}{m'}\frac{1}{n}\int dn$	$\frac{1}{m'}\int de$	$\frac{1}{m'}\int e d\varpi$
I.	V .	+ 0·01 63	− 0·17 44	+ 0·86 04
II.	V_4 .	+ 0·27 82	− 0·00 96	− 0·02 89
II.	V_3 .	− 0·92	− 0·27 8	− 1·25
III.	V_4 .	− 0·30 02	− 0·00 39	− 0·06 83
III.	V_3 .	+ 0·18	+ 0·31 4	− 1·27
IV.	V .	+ 1·36 34	+ 0·11 56	+ 0·89 73
	Sum	+ 0·62	− 0·03 6	− 0·86

Substituting $m' = \frac{1}{3501\cdot 6}$

$$\frac{1}{n}\int dn = +\cdot 000\ 177 \qquad \int de = -\cdot 000\ 010 \qquad \int d\varpi = -\cdot 000\ 254$$ radians.

De Pontécoulant's results are

+ ·000 129 − ·001 105 − ·000 230

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To calculate $\int d\zeta$

Quadrant	$\frac{1}{m'}\int\frac{dn}{n}(2\pi - nt)$	$\frac{\int d\epsilon}{m'} - \frac{\int d\varpi}{m'}\left\{1 - \sqrt{(1-e^2)}\right\}$	$\frac{e\int d\varpi}{m'}$
I. .	+0·674	− ·30 95	+ ·86 04
II. .	+1·524	+ ·31 75	− ·02 89
III. .	−0·237	+ ·32 12	− ·06 83
IV. .	+1·037	− ·84 65	+ ·89 73
Sums	+2·998	− ·51 73	+1·66 05

Hence $\frac{1}{m'}\int d\zeta$ (mechanical quadratures only)

$$= +2·998 - 0·517 - ·436 = +2·05$$

Again

$$\frac{1}{m'}\left[\int d\zeta + \sqrt{(1-e^2)}\int d\varpi - \frac{2\pi - nt}{n}\int dn\right]_{u=90°}^{u=270°} \quad . \quad . \quad . \quad = -6·08$$

$$-\frac{\sqrt{(1-e^2)}}{e} \times \frac{e\int d\varpi}{m'} \text{ between limits} \quad . \quad . \quad . \quad . \quad = +0·66$$

$$\frac{1}{m'}\frac{2\pi - nt}{n}\int dn \text{ at upper limit} = -1·40 \times 0·6036 \quad . \quad . \quad = -0·85$$

$$-\text{ditto at lower limit} = -(-0·68) \times 5·6796 \quad . \quad . \quad = +3·86$$

Sum − 2·41

Hence $\frac{1}{m'}\int d\zeta$ (V_3 only) = − 2·41

$$\frac{1}{m'}\int d\zeta = -0·36 \text{ (complete value),}$$

or putting $m' = \frac{1}{3501·6}$

$$\int d\zeta = -·000\ 103 \text{ radians.}$$

De Pontécoulant gives − ·000628 radians.

Hence his value of the next perihelion passage, considering the action of Saturn only, is two days later than ours. De Pontécoulant's eccentricity is again certainly in error; presumably

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the same (or approximately the same) factor has been omitted as in the case of Jupiter.

Errata in previous Paper.

Page 386, $e_x = -(1-e^2)\sin u \cos u$.

Page 393, *read* η' *for* y' in the value of $\frac{x'}{a}$.

Page 411, second line, *read* −0·001129 *for* −0·000273; hence, third line, *read* +0·147631 *for* +0·148487,

$$\int d\zeta = +\cdot15506 \text{ for } +\cdot15592 \text{ radians.}$$

Last line, *for* thirteen days *read* nine days.

Observations of Comets d, e, and g 1906, from Photographs taken with the 30-inch Reflector of the Thompson Equatorial at the Royal Observatory, Greenwich.

(*Communicated by the Astronomer Royal.*)

The following positions of Comets *d*, *e*, and *g*, 1906, were obtained from photographs taken with the 30-inch Reflector.

The plates were measured with the astrographic micrometer. Six reference stars were, as a rule, measured with the Comet, their positions being derived when possible from the Catalogues of the Astronomische Gesellschaft.

The positions given are not corrected for Parallax.

log Parallax Correction = log Parallax Factor − log Δ.

Comet *d* 1906.

Date and G.M.T. 1906.			Apparent R.A.	Apparent Dec.	Log. Parallax Factor.	
					R.A.	Dec.
	d	h m s	h m s	° ′ ″		
July	25	13 59 38	0 43 30·75	− 8 58 20·3	−9·358	+0·872
	31	14 7 57	1 35 5·93	− 4 19 2·5	−9·399	+0·854
Aug.	1	14 5 57	1 44 7·08	− 3 27 42·2	−9·412	+0·850
	3	13 59 54	2 2 21·04	− 1 42 58·7	−9·442	+0·843
	3	14 21 36	2 2 29·32	− 1 42 11·0	−9·402	+0·843
	4	13 53 12	2 11 30·43	− 0 49 56·6	−9 459	+0·839
	4	14 8 10	2 11 36·04	− 0 49 19·2	−9·436	+0·839
	14	14 11 10	3 40 36·13	+ 7 37 57·9	−9·504	+0·808
	15	14 23 15	3 48 52·33	+ 8 22 15·6	−9·496	+0·803
	19	14 55 33	4 19 59·80	+11 1 30·2	−9·477	+0·786
	27	14 17 43	5 12 40·71	+14 56 14·7	−9·547	+0·785
	28	14 21 16	5 18 30·25	+15 19 1·4	−9·547	+0·783
Sept.	1	14 48 29	5 40 16·79	+16 37 58·2	−9·530	+0·767
	25	15 16 08	7 13 11·97	+20 10 58·4	−9·565	+0·763
	26	14 49 5	7 16 1·49	+20 14 12·5	−9·537	+0·743
Oct.	16	15 33 34	8 1 39·08	+20 49 14·0	−9·421	+0·696
	27	16 39 11	8 17 18·34	+21 5 31·8	−9·106	+0·656